Onan

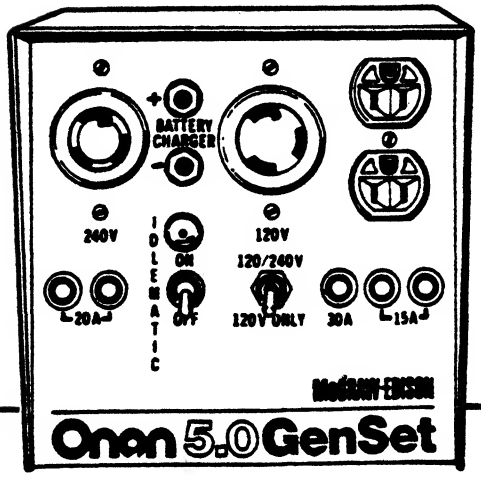
Operators Manual

1.7 - 5.0 kW

P-Series

GenSets

- Lightweight Portable Generators
- Residential and Contractor Models



919-0120
(SPEC J)
12-81

Safety Precautions

The following symbols in this manual signal potentially dangerous conditions to the operator or equipment. Read this manual carefully before operating your unit. Know when these conditions can exist. Then, take necessary steps to protect personnel as well as equipment.

WARNING ***This symbol is used throughout this manual to warn of possible serious personal injury or death.***

CAUTION ***This symbol refers to possible equipment damage.***

Fuels, electrical equipment, batteries, exhaust gases and moving parts present potential hazards that could result in serious, personal injury. Take care and follow these recommended procedures.

Do not work on this equipment when mentally or physically fatigued.

- **Use Extreme Caution Near Gasoline, Gaseous Fuel and Diesel Fuel. A constant potential explosive or fire hazard exists.**

  Do not fill fuel tank with engine running. Do not smoke or use open flame near the unit or the fuel tank.

  Be sure all fuel supplies have a positive shutoff valve between the fuel tank and generator set.

  Fuel lines must be of steel piping, adequately secured and free of leaks. Use a flexible section of fuel line between generator set fuel pump and incoming stationary fuel supply line. This flexible section must be 100% NON-METALLIC to prevent electrical current from using it as a conductor. Do NOT use copper tubing for flexible fuel lines as copper will work harden and become brittle enough to break. Use black pipe on natural gas or gaseous fuel models, but NOT on gasoline or diesel fuel models. Piping at the engine connection must be approved flexible line. The fuel line must be routed separately and never tied together with any electrical wiring.

  Have a fire extinguisher nearby. Be sure extinguisher is properly maintained and be familiar with its proper use. Extinguishers rated ABC by the NFPA are appropriate for all applications. Consult the local fire department for the correct type of extinguisher for various applications.

- **Guard Against Electric Shock**

  Disconnect electric power before removing protective shields or touching electrical equipment. Use rubber insulative mats placed on dry wood platforms over floors that are metal or concrete when around electrical equipment. Do not wear damp clothing (particularly wet shoes) or allow skin surfaces to be damp when handling electrical equipment.

  Jewelry is a good electrical conductor and should be removed before working on any electrical equipment.

  Use extreme caution when working on electrical components. High voltages can cause severe personal injury or death.

  Follow all state and local electrical codes. Have all electrical installations performed by a qualified licensed electrician.

  Always use an appropriately sized, approved double-throw transfer switch with any generator set. DO NOT PLUG OR CONNECT ANY PORTABLE, MOBILE OR STANDBY SET DIRECTLY INTO A HOUSE RECEPTACLE OR DISTRIBUTION BOX TO PROVIDE EMERGENCY POWER. It is possible for current to flow from generator into the utility line. This creates extreme hazards to anyone working on lines to restore power.

- **Do Not Smoke While Servicing Batteries**

  Lead acid batteries emit a highly explosive hydrogen gas that can be ignited by flame, electrical arcing or by smoking.

- **Exhaust Gases Are Toxic**

  Provide an adequate exhaust system to properly expel discharged gases. Inspect exhaust system visually and audibly for leaks daily. Ensure that exhaust manifold is secure and not warped. Be sure the unit is well ventilated. Don't use discharged cooling air for compartment heating since it could contain poisonous exhaust gases.

  Engine exhaust contains CARBON MONOXIDE, a dangerous gas that is potentially lethal. Avoid carbon monoxide inhalation by NOT operating the generator set in any type of enclosure that could allow exhaust gases to accumulate. On portable models, locate the generator set so that exhaust is directed away from any building windows or entrances.

- **Keep the Unit and Surrounding Area Clean**

  Remove all oil deposits. Remove all unnecessary grease and oil from the unit. Accumulated grease and oil can cause overheating and subsequent engine damage and may present a potential fire hazard.

  Do NOT store anything in the generator compartment or on the unit itself such as oil or gas cans, oily rags, chains, wooden blocks, etc. A fire could result or the generator set operation may be adversely affected. Keep the set and/or compartment and floor clean and dry.

  Do not steam clean the generator set while the engine is running. When cleaning, do not spray directly into the generator, control box, or air cleaner.

- **Protect Against Moving Parts**

  Avoid moving parts of the unit. Loose jackets, shirts or sleeves should not be worn because of the danger of becoming caught in moving parts.

  Make sure all nuts and bolts are secure. Keep power shields and guards in position.

  If adjustments *must* be made while the unit is running, use extreme caution around hot manifolds, moving parts, etc.

Important Safety Precautions

Read and observe these safety precautions when using or working on electric generators, engines and related equipment. Also read and follow the literature provided with the equipment.

Proper operation and maintenance are critical to performance and safety. Electricity, fuel, exhaust, moving parts and batteries present hazards that can cause severe personal injury or death.

FUEL, ENGINE OIL, AND FUMES ARE FLAMMABLE AND TOXIC

Fire, explosion, and personal injury can result from improper practices.

- Used engine oil, and benzene and lead, found in some gasoline, have been identified by government agencies as causing cancer or reproductive toxicity. When checking, draining or adding fuel or oil, do not ingest, breathe the fumes, or contact gasoline or used oil.
- Do not fill tanks with engine running. Do not smoke around the area. Wipe up oil or fuel spills. Do not leave rags in engine compartment or on equipment. Keep this and surrounding area clean.
- Inspect fuel system before each operation and periodically while running.
- Equip fuel supply with a positive fuel shutoff.
- Do not store or transport equipment with fuel in tank.
- Keep an ABC–rated fire extinguisher available near equipment and adjacent areas for use on all types of fires except alcohol.
- Unless provided with equipment or noted otherwise in installation manual, fuel lines must be copper or steel, secured, free of leaks and separated or shielded from electrical wiring.
- Use approved, non-conductive flexible fuel hose for fuel connections. Do not use copper tubing as a flexible connection. It will work–harden and break.

EXHAUST GAS IS DEADLY

- Engine exhaust contains carbon monoxide (CO), an odorless, invisible, poisonous gas. Learn the symptoms of CO poisoning.
- Never sleep in a vessel, vehicle, or room with a genset or engine running unless the area is equipped with an operating CO detector with an audible alarm.
- Each time the engine or genset is started, or at least every day, thoroughly inspect the exhaust system. Shut down the unit and repair leaks immediately.
- Warning: Engine exhaust is known to the State of California to cause cancer, birth defects and other reproductive harm.

Make sure exhaust is properly ventilated.

- Vessel bilge must have an operating power exhaust.
- Vehicle exhaust system must extend beyond vehicle perimeter and not near windows, doors or vents.
- Do not use engine or genset cooling air to heat an area.
- Do not operate engine/genset in enclosed area without ample fresh air ventilation.
- Expel exhaust away from enclosed, sheltered, or occupied areas.
- Make sure exhaust system components are securely fastened and not warped.

MOVING PARTS CAN CAUSE SEVERE PERSONAL INJURY OR DEATH

- Do not remove any guards or covers with the equipment running.
- Keep hands, clothing, hair, and jewelry away from moving parts.
- Before performing any maintenance, disconnect battery (negative [–] cable first) to prevent accidental starting.
- Make sure fasteners and joints are secure. Tighten supports and clamps, keep guards in position over fans, drive belts, etc.
- If adjustments must be made while equipment is running, use extreme caution around hot manifolds and moving parts, etc. Wear safety glasses and protective clothing.

BATTERY GAS IS EXPLOSIVE

- Wear safety glasses and do not smoke while servicing batteries.
- Always disconnect battery negative (–) lead first and reconnect it last. Make sure you connect battery correctly. A direct short across battery terminals can cause an explosion. Do not smoke while servicing batteries. Hydrogen gas given off during charging is explosive.
- Do not disconnect or connect battery cables if fuel vapors are present. Ventilate the area thoroughly.

DO NOT OPERATE IN FLAMMABLE AND EXPLOSIVE ENVIRONMENTS

Flammable vapor can be ignited by equipment operation or cause a diesel engine to overspeed and become difficult to stop, resulting in possible fire, explosion, severe personal injury and death. **Do not operate diesel equipment where a flammable vapor environment can be created by fuel spill, leak, etc., unless equipped with an automatic safety device to block the air intake and stop the engine.**

HOT COOLANT CAN CAUSE SEVERE PERSONAL INJURY

- Hot coolant is under pressure. Do not loosen the coolant pressure cap while the engine is hot. Let the engine cool before opening the pressure cap.

ELECTRICAL SHOCK CAN CAUSE SEVERE PERSONAL INJURY OR DEATH

- Do not service control panel or engine with unit running. High voltages are present. Work that must be done while unit is running should be done only by qualified service personnel.
- Do not connect the generator set to the public utility or to any other electrical power system. Electrocution can occur at a remote site where line or equipment repairs are being made. An approved transfer switch must be used if more than one power source is connected.
- Disconnect starting battery (negative [–] cable first) before removing protective shields or touching electrical equipment. Use insulative mats placed on dry wood platforms. Do not wear jewelry, damp clothing or allow skin surface to be damp when handling electrical equipment.
- Use insulated tools. Do not tamper with interlocks.
- Follow all applicable state and local electrical codes. Have all electrical installations performed by a qualified licensed electrician. Tag open switches to avoid accidental closure.
- With transfer switches, keep cabinet closed and locked. Only authorized personnel should have cabinet or operational keys. Due to serious shock hazard from high voltages within cabinet, all service and adjustments must be performed by an electrician or authorized service representative.

If the cabinet must be opened for any reason:

1. Move genset operation switch or Stop/Auto/Handcrank switch (whichever applies) to Stop.
2. Disconnect genset batteries (negative [–] lead first).
3. Remove AC power to automatic transfer switch. If instructions require otherwise, use extreme caution due to shock hazard.

MEDIUM VOLTAGE GENERATOR SETS (601V TO 15kV)

- Medium voltage acts differently than low voltage. Special equipment and training are required to work on or around medium voltage equipment. Operation and maintenance must be done only by persons trained and qualified to work on such devices. Improper use or procedures will result in severe personal injury or death.
- Do not work on energized equipment. Unauthorized personnel must not be permitted near energized equipment. Induced voltage remains even after equipment is disconnected from the power source. Plan maintenance with authorized personnel so equipment can be de-energized and safely grounded.

GENERAL SAFETY PRECAUTIONS

- Do not work on equipment when mentally or physically fatigued or after consuming alcohol or drugs.
- Carefully follow all applicable local, state and federal codes.
- Never step on equipment (as when entering or leaving the engine compartment). It can stress and break unit components, possibly resulting in dangerous operating conditions from leaking fuel, leaking exhaust fumes, etc.
- Keep equipment and area clean. Oil, grease, dirt, or stowed gear can cause fire or damage equipment by restricting airflow.
- Equipment owners and operators are solely responsible for operating equipment safely. Contact your authorized Onan/Cummins dealer or distributor for more information.

KEEP THIS DOCUMENT NEAR EQUIPMENT FOR EASY REFERENCE.

Onan

Supplement 919-1042

Date: 6/82
Insert with -
Title: Operator's Manual
Number: 919-0120

The following supplemental information is for two new "P"-series models which are:

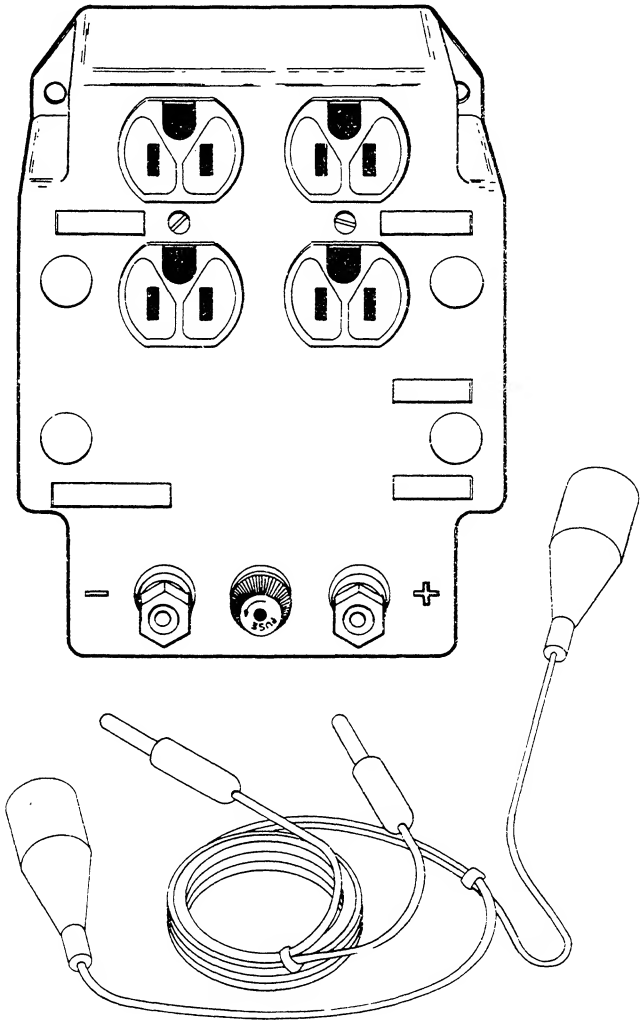
1.7PE-1P/24950J 1750 Watts
2.2PE-1P/24950J 2250 Watts

Index this information in your current Operator's manual (919-0120).

These new models include a factory installed 10-amp battery charging circuit with full wave rectification as standard. This item is NOT available in kit form for any other models. The operation is the same as with larger kW Spec J models that have a battery charging circuit. A typical control panel is illustrated below.

The remaining specifications for these new models are the same as those shown on page 2 of the Operator's manual for the 1.7PE-1P/1J and 2.2PE-1P/1J models.

The 305-0593 battery charging kit will NOT fit above models as the stator charging winding is NOT the same as the one used in those models that utilize this kit.



TYPICAL CONTROL PANEL ASSEMBLY WITH FACTORY INSTALLED BATTERY CHARGING

Table of Contents

WARNING

MANUFACTURER RECOMMENDS THAT ALL SERVICE INCLUDING INSTALLATION OF REPLACEMENT PARTS BE DONE BY QUALIFIED ELECTRICAL AND/OR MECHANICAL SERVICE PERSONNEL. TO PREVENT POSSIBLE INJURY AND/OR EQUIPMENT DAMAGE IT IS IMPORTANT THAT ALL SERVICE PERSONNEL BE QUALIFIED.

Specifications

RESIDENTIAL MODELS

Model Number	1.7PE-1P	2.2PE-1P	3.0PL-1P	3.0PL-3P	3.7PP-3P	5.0PN-3E	5.0PN-3P
Power Rating (watts)	1750	2250	3000	3000	3750	5000	5000
Output Voltage	120	120	120	120/240	120/240	120/240	120/240
Engine Horsepower	5	5	7	7	8	11	11
Engine Disp. c.i. (cm^3)	12.57 (206.0)	12.57 (206.0)	16.79 (275.1)	16.79 (275.1)	19.44 (318.5)	24.36 (399.2)	24.36 (399.2)
Engine RPM	3600	3600	3600	3600	3600	3600	3600
Oil Capacity pt. (L)	1.25 (0.59)	1.25 (0.59)	2.75 (1.3)	2.75 (1.3)	2.75 (1.3)	3.0 (1.42)	3.0 (1.42)
Fuel Tank Capacity qt. (L)	3 (2.83)	3 (2.83)	4 (3.78)	4 (3.78)	4 (3.78)	6 (5.67)	6 (5.67)
Weight lbs. (Kg)	63 (29)	66 (30)	93 (42)	93 (42)	118 (54)	149 (68)	147 (67)
Starting Method	Manual Recoil	Manual Recoil	Manual Recoil	Manual Recoil	Manual Recoil	12 Volt Electric	Manual Recoil
Spark Plug Gap in. (mm)	.030 (.76)	.030 (.76)	.030 (.76)	.030 (.76)	.030 (.76)	.030 (.76)	.030 (.76)

CONTRACTOR MODELS

Model Number	2.2PEI-1P	3.2PFI-3P	3.7PFI-3P	5.0PKI-3P
Power Rating (watts)	2250	3250	3750	5000
Output Voltage	120	120/240	120/240	120/240
Engine Horsepower	5	8	8	10
Engine Disp. c.i. (cm^3)	12.57 (206.0)	19.44 (318.5)	19.44 (318.5)	22.04 (361.2)
Engine RPM	3600	3600	3600	3600
Oil Capacity pt. (L)	1.25 (0.59)	2.75 (1.3)	2.75 (1.3)	2.50 (1.18)
Fuel Tank Capacity qt. (L)	3 (2.83)	6 (5.67)	6 (5.67)	6 (5.67)
Weight lbs. (Kg)	73 (33)	110 (50)	124 (56)	160 (73)
Starting Method	Manual Recoil	Manual Recoil	Manual Recoil	Manual Recoil
Spark Gap in. (mm)	.030 (.76)	.030 (.76)	.030 (.76)	.030 (.76)

Operation

ABOUT THIS MANUAL

This manual provides complete information for operating, maintaining, and adjusting the alternator. Study this manual carefully and observe all warnings and cautions. Using the alternator properly and following a regular maintenance program will result in longer alternator life, better performance, and safer operation.

When contacting your Onan Dealer, always supply the complete Model Number and Serial Number as shown on the unit nameplate. This information is necessary to identify your alternator from among the many types of units manufactured by Onan.

A separate model, type, and code number is stamped on the engine blower housing by the engine manufacturer. These numbers may be used to obtain parts or service for the engine only from an Authorized Briggs & Stratton Service Center.

A reader comment form is located next to the rear cover. Your comments and questions about this manual will help us produce a better publication in the future. Please detach and fill out this card and send back to Onan Corporation. Postage is prepaid.

INITIAL START

Fill the engine crankcase with oil and the fuel tank with fuel before attempting to operate the alternator.

Refer to the MAINTENANCE section for the lubricating oil and fuel recommendations. In addition, inspect new units for loose, missing, or damaged parts and correct as required.

WARNING ***Do not permit any flame, cigarette, or other igniter near the fuel system. Fuel is highly flammable and potentially explosive and could result in severe personal injury or death.***

LOCATION

Operate the alternator outdoors where the exhaust gases and engine waste heat can be discharged directly into the open air. Do not operate the alternator in-doors or in any type of enclosure that may allow exhaust fumes to accumulate. Do not operate the alternator near an open window, door, air intake, or any other place where exhaust gases may enter the interior or a building.

BATTERY CONNECTIONS (Electric Start Models)

A 12 volt battery is required for the electric start model alternators. A 32 AMP hour lead-acid battery (BCI Group U1) is recommended.

Fasten positive (+) and negative (-) cables to corresponding battery terminals. Attach negative cable last to prevent the possibility of arcing.

WARNING

ENGINE EXHAUST GAS (CARBON MONOXIDE) IS DEADLY!

Carbon monoxide is an odorless, colorless gas formed by incomplete combustion of hydrocarbon fuels. Carbon monoxide is a dangerous gas that can cause unconsciousness and is potentially lethal. Some of the symptoms or signs of carbon monoxide inhalation are:

- ***Dizziness***
- ***Intense Headache***
- ***Weakness and Sleepiness***
- ***Vomiting***
- ***Muscular Twitching***
- ***Throbbing in Temples***

If you experience any of the above symptoms, get out into fresh air immediately.

The best protection against carbon monoxide inhalation is proper installation and regular, frequent inspections of the complete exhaust system. If you notice a change in the sound or appearance of exhaust system, shut the unit down immediately and have it inspected and repaired by a competent mechanic.

GROUNDING REQUIREMENTS

The alternator has all non-current carrying metal parts electrically bonded and solidly connected to the alternator neutral to meet National Electric Code requirements for portable AC alternators. Local code enforcement officials may require that the alternator frame be electrically connected to a grounding electrode (water pipe, earth-driven grounding rod, etc.) during operation. A grounding lug (see Figure 1) has been provided for connecting the alternator frame to a grounding electrode conductor if required.

WARNING ***If faulty electrical equipment is connected to the alternator, an electrical shock hazard exists which could result in serious personal injury or death. Check all electrical equipment for frayed cords or breaks in the insulation before using.***

Properly maintain all electrical equipment used with the alternator. As a minimum measure of protection, use only 3-wire or double insulated equipment. All 3-wire equipment must be used only with properly maintained 3-wire extension cords. Additional backup protection (in case of a faulty equipment grounding wire or flawed insulation) can be provided by Ground Fault Circuit Interrupters (GFCI's). It is recommended that where moisture or faulty cord-and-plug equipment may represent a hazard, GFCI's be used in addition to (but not instead of) the protection provided by 3-wire equipment or double insultaion.

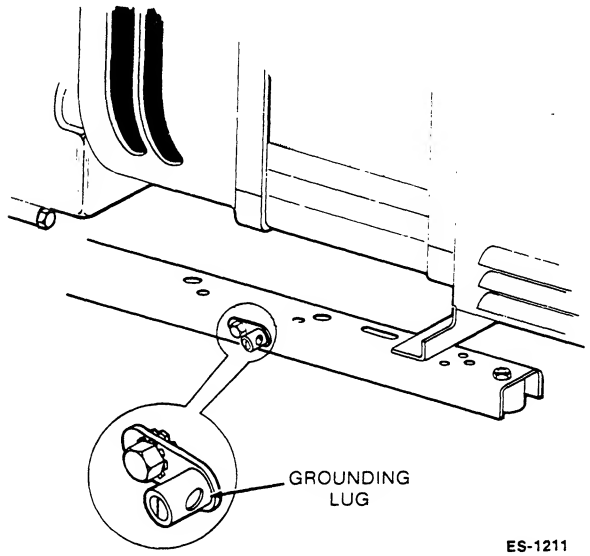


FIGURE 1. GROUNDING CONNECTION

STARTING/STOPPING

The following sections cover starting and stopping the generator set.

Manual Start

Manual start models have a recoil type rope starter mounted on the front of the engine. Electric start models have a rope sheave at the front of the engine for manual starting if necessary. Wind the pull rope around the sheave for each starting attempt.

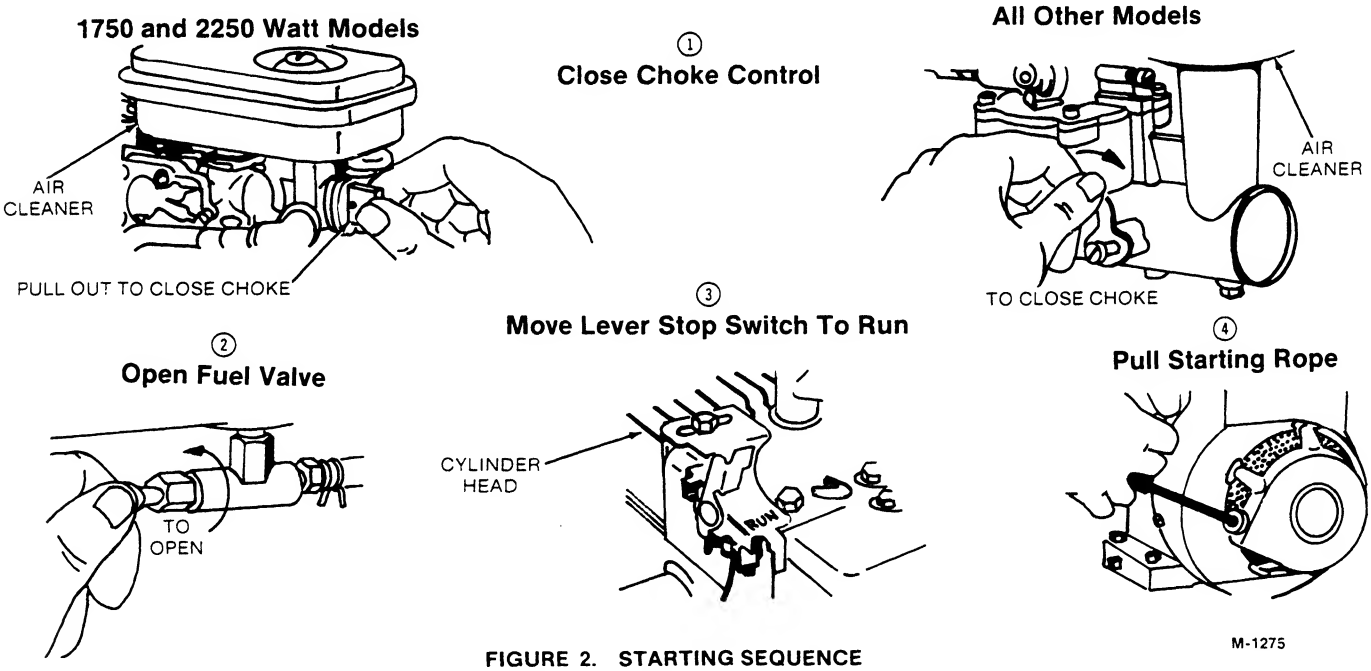


FIGURE 2. STARTING SEQUENCE

Refer to Figure 2 for the location of the lever stop switch, fuel shut-off valve, and choke control. Nothing should be plugged into the alternator during starting. Use the following procedure to start the engine:

1. Move the choke control to the full closed position unless the engine is already warm from previous operation. A warm engine requires less choking than a cold engine.

2. Open the fuel shut-off valve by turning in a counter-clockwise direction. (1750 and 2250 watt models do not have a fuel shut-off valve.)

3. Place the lever stop switch in the RUN position. (When manually starting electric start models, place the Start/Stop switch in the center position. See Figure 3.)

4. Pull the starting rope with a fast steady pull to overcome compression and prevent kickback. Do not jerk the rope or let it snap back into the rewind mechanism. Repeat if necessary with choke opened slightly.

5. Open the choke gradually when the engine starts.

Electric Start

Refer to Figure 2 for the location of the fuel shut-off valve and choke control. Nothing should be plugged into the alternator during starting. Use the following procedure to start the engine.

1. Move the choke control to the fully closed position unless the engine is already warm from previous operation. A warm engine requires less choking than a cold engine.

2. Open the fuel shut-off valve by turning in a counter-clockwise direction.

3. Push the Start/Stop switch on the receptacle panel (see Figure 3) to the start position.

4. Release the Start/Stop switch as soon as the engine starts and open the choke gradually.

Use short starting cycles (2 to 3 seconds) to provide the longest battery life. The set starting battery is recharged during operation by a battery charger which is standard equipment on electric start models. The standard charger provides a constant charge rate of one amp during alternator operation.

Winter Starting Tips

Cold engines are sometimes difficult to start. The following suggestions may help overcome cold weather starting difficulties:

1. Use the proper viscosity oil for the temperature expected.

2. Use fresh winter grade gasoline. Winter grade gasoline has a higher volatility to improve starting. Avoid using gasoline that was purchsed during the summer.

3. Keep the battery fully charged and allow it to warm up indoors before using. A warm battery has a higher starting capacity.

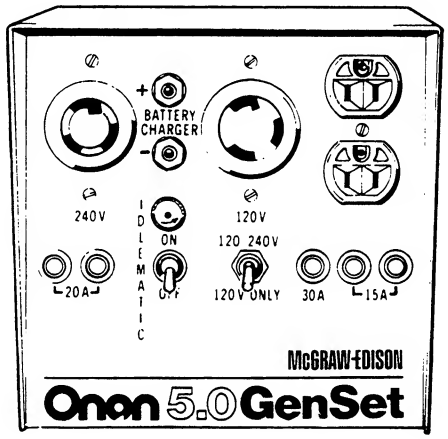
4. Protect the unit from direct exposure to the weather when not in operation.

5. Do not change the carburetor main adjustment screw setting or the engine may lose power.

Stopping

Sets With Manual Recoil Starter: Move the lever stop switch to STOP position.

Sets With Electric Starter: Push the Start/Stop switch on the receptacle panel to the stop position.



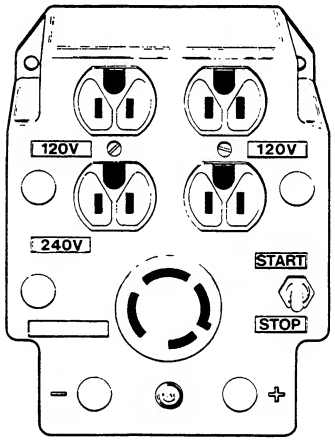


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FIGURE 3. TYPICAL RECEPTACLE PANELS

CONNECTING A LOAD

If practical, allow the alternator to warm up before connecting a load. Receptacles are located on a panel on the end of the alternator as shown in Figure 3. Connect the load by inserting the load wire plugs into the proper output receptacle. Use the receptacle (120 volt duplex, 120 volt twist-lock, 240 volt twist-lock, or 240 volt duplex) that corresponds to the equipment plug.

Power Output Rating

The alternator maximum power output is stamped on the nameplate. Do not exceed the maximum power output rating by connecting too many loads.

CAUTION ***Continuous overloading will cause high operating temperatures that can damage the alternator. Keep load within the alternator's rating.***

To determine if the load is within the maximum power output rating of the alternator set, add up the wattage requirements of all the electical loads that will be operated simultaneously. Most appliances or tools have the wattage requirements imprinted on the nameplate. Table 1 can be used as a guide if the wattage requirements are not listed on the equipment. The total should be LESS than the maximum power output rating of the alternator. See Derating section for factors that affect the maximum power output.

TABLE 1
POWER REQUIREMENTS FOR APPLIANCES

Appliance or Tool	Approximate Running Wattage
Air Conditioner	800-4000
Attic Fan	375
Battery Charger	Up to 800
Broiler	1325
Clothes Dryer	4500
Clothes Washer	250-1000
Coffee Percolator	550-700
Dishwasher (conventional)	300
Dishwasher (heating element)	1150
Electric Blanket	50-200
Electric Broom	200-500
Electric Drill	250-750
Electric Frying Pan	1000-1350
Electric Iron	500-2000
Electric Saw	400-1500
Electric Stove (per element)	350-1000
Electric Water Heater	1000-1500
Electric Water Pump	500-600
Freezer	300-1000
Furnace Fan	225
Garbage Disposal Unit	325
Hair Dryer	350-500
Space Heater	1000-1500
Microwave Oven	700-1500
Oil Burner	250
Radio	50-200
Refrigerator	600-1000
Sump Pump	250-500
Television	200-600
Vacuum Cleaner	500-1500
Well Water Pump	250-1000

Derating

The alternator maximum power output is based on operation at sea level at 60° F ambient temperature. When the alternator is operated at altitudes above sea level or at temperatures above 60° F, the power rating must be derated. The reduction in the power rating is necessary to compensate for the reduction in engine horsepower that occurs at higher altitudes or higher temperatures.

A general rule applies for derating an alternator because of changes in temperature or altitude. A one percent deration can be expected for every 10° F rise in temperature above 60° F (16° C). A 3.5 percent deration can be expected for every 1000 foot increase in altitude above sea level.

For example: A 5000 watt alternator operating at 80° F (27° C) ambient temperature and at 3000 feet above sea level should be derated by 12.5 percent or 625 watts.

5000 - 625 = 4375 (derated power output)

Circuit Breakers (If Equipped)

Circuit breakers are standard equipment on certain alternators. Circuit breakers limit current flow by opening when the current flow exceeds a specified amount. If a circuit breaker should open while the set is operating, locate and correct the cause of the overcurrent. When the problem is corrected, push the reset button to restore power to the circuit.

Voltage Selector Switch (If Equipped)

The voltage selector switch is standard equipment on certain dual voltage alternators.

When the switch is in the 120 V ONLY position, power may be drawn from the single 120 volt ***twist lock*** receptacle and from the 120 volt ***duplex*** receptacle. When the switch is in the 120/240 V position, power may be drawn from the 240 volt ***twist lock*** receptacle and from the 120 volt **duplex** receptacle. The 120 volt twist lock receptacle should only be used when the selector switch is in the 120 V ONLY position. Drawing power simultaneously from the 120 and 240 volt twist lock receptacles will place an unbalanced load on the alternator.

VOLTAGE BUILD UP

The AC voltage should quickly build up as soon as the alternator is started. If no AC voltage is present, it is possible that the alternator field laminations have lost their residual magnetism. This can happen when the alternator is not used for long periods of time or if the unit is dropped. Contact an authorized service center for assistance if no AC voltage is present.

BREAK-IN PROCEDURE

Controlled break-in with the proper oil and a conscientiously applied maintenance program will help to assure satisfactory service from your alternator. Break-in is as follows:

1. One half-hour with 1/2 load applied.
2. One half-hour with 3/4 load applied.
3. Change crankcase oil after the first 5 hours of operation.

The alternator is designed to operate with a load applied. When possible, avoid running the alternator for extended periods of time without a load, especially during the first 50 hours of operation. Failure to follow the recommended break-in procedure may result in poor piston ring seating.

IDLEMATIC CONTROL (Optional Accessory)

The idlematic is a solid-state device that slows engine speed from its normal 3600 RPM to approximately 2250 RPM when electrical load is removed from the alternator. This allows longer engine life, lower fuel consumption and a lower average noise level.

When a load is placed on the alternator, the idlematic control senses the load and opens the throttle so the set runs at 3600 RPM. A toggle switch mounted on the receptacle panel turns the idlematic on or off.

Using the Idlematic Control: Place the idlematic switch in the OFF position and start the alternator. Place the switch in the ON position with no load connected. Within 75 seconds, engine RPM should drop from full load speed to idle speed. Connecting a load of 30 watts or more will cause engine RPM to increase to full load speed. After the first cycle, disconnecting the load will cause engine RPM to drop to idle speed after a delay of only 12 to 15 seconds. The initial long delay period (up to 75 seconds) before the engine drops to idle speed will occur only on the first cycle of operation. Place the idlematic switch in the OFF position to deactivate.

HIGH/LOW OPERATING TEMPERATURES

The alternator will operate satisfactorily in both high (above 100° F/38° C) and low (below 0° F/-18° C) temperatures. Use the oil recommended in the MAINTENANCE section for the expected temperature conditions.

High Operating Temperatures

1. See that nothing obstructs air flow to and from the alternator.
2. Keep cooling fins clean. Cylinder air housings should be properly installed and undamaged.

Low Operating Temperatures

1. Use fresh gasoline and keep the tank filled to avoid condensation.
2. Keep the spark plug clean and correctly gapped.
3. Maintain the battery on electric start models in a well charged condition.

EXTREMELY DUSTY OR DIRTY CONDITIONS

Observe the following when operating the alternator in extremely dusty or dirty conditions:

1. Keep the alternator clean and do not allow dust and dirt to accumulate.
2. Clean the air cleaner element more often than the recommended service interval.
3. Keep oil and gasoline in dust-tight containers suitable for the storage of fuels.

OUT-OF-SERVICE PROTECTION

Protect a unit that will be out of service for more than 6 months as follows:

1. Run the engine until it reaches normal operating temperature.
2. Turn off the fuel supply and run the engine until it stops.
3. Drain oil from oil base while the engine is still warm. Refill with fresh crankcase oil and attach a tag stating viscosity used.

WARNING ***Hot crankcase oil could cause burns. When draining the crankcase, take precautions such as wearing protective clothing to avoid splashing hot oil on skin or face.***

4. Remove spark plug. Pour 1 ounce (30 ml) of engine oil into the cylinder. Crank the engine over a few times and reinstall the spark plug.
5. Service air cleaner as outlined in MAINTENANCE section.
6. Clean governor linkage and protect by wrapping with a clean cloth.
7. Tie a plastic bag over the exhaust outlet to prevent entrance of moisture, dirt, bugs, etc.
8. Wipe entire alternator. Coat rustable parts with a light film of grease or oil.
9. Provide a suitable cover for the entire unit.
10. If battery equipped, disconnect battery and store in a cool dry place.

To Return To Service

1. Remove cover and all protective wrapping. Remove plug from exhaust outlet.
2. Check tag on oil base and verify that oil viscosity is still correct for existing ambient temperatures.
3. Clean and check battery on electric start alternators. If the electrolyte level is low, add distilled water and charge. DO NOT OVERCHARGE.
4. Check that fuel filter and fuel lines are secure, with no leaks.
5. Remove spark plug and crank engine to clear any remaining oil from the combustion chamber. Check spark plug gap and reinstall.
6. Connect battery and start engine. After engine has started, blue smoke is exhausted until the excess oil has burned away.
7. After starting, apply load to at least 50 percent of the maximum power output.
8. Alternator is ready for service.

BATTERY CHARGER OPERATION (Optional Accessory)

Two optional battery chargers are offered with this series of alternators. A 10 amp battery charger is available as a factory installed option on models 1.7 PE-1P and 2.2 PE-1P. A 5 to 8 amp battery charger is available as an optional accessory on all other models except the 2.2 PEI-1P. Both chargers operate the same and are designed for charging 12 volt batteries ONLY. Each charger provides its rated charging current (amps) on a continuous basis and does not taper off the charge rate as the battery becomes charged.

Before connecting battery to charger, check battery electrolyte level and add distilled water to battery if level is low. Check battery electrolyte level periodically during charging and add water if level drops.

CAUTION ***When operating battery charger, the charging rate does not taper off as battery becomes recharged. DO NOT OVERCHARGE batteries as prolonged charging could cause the battery to boil dry and ruin battery.***

To use charger, connect cables as follows:

1. Connect the ten foot color coded charging cables to battery terminals, red to positive (+) and black to negative (-).
2. Connect charger cables to the red (+) and black (-) terminals on the receptacle panel. Always observe correct polarity, positive to positive (red to red) and negative to negative (black to black).
3. To disconnect charger, first remove cables from receptacle terminals. Do not disconnect charger cables at the battery while charger is operating to avoid creating sparks near the battery.

WARNING ***Lead acid batteries emit highly explosive hydrogen gas which can be ignited by electrical arcing or a lighted cigarette. Do not smoke while charging or servicing batteries.***

Maintenance

Regularly scheduled maintenance is the key to lower operating costs and longer service life for the alternator. Use the time intervals shown in the Periodic Maintenance Schedule as a guide for regular maintenance.

However, actual operating conditions should be the determining factor in establishing a maintenance schedule. The maintenance time intervals must be reduced when operating in very dusty or dirty conditions or hot and cold temperature extremes.

Periodic Maintenance Schedule

WARNING ***Always allow alternator to cool off before performing any maintenance. Working on a hot unit could cause severe burns.***

SERVICE THESE ITEMS	AFTER EACH CYCLE OF INDICATED HOURS				
	Daily or after 5 hours	25	50	100	500
General Inspection	X1				
Check Oil Level	X				
Change Crankcase Oil		X2			
Clean Air Cleaner Foam Element		X2			
Clean Spark Arrester			X		
Clean or Replace Spark Plugs				X	
Clean Cooling Fins				X2	
Clean Air Cleaner Secondary Element				X2	
Replace Fuel Filter					X
Check Battery and Recharge	Monthly				
Clean Carbon From Cylinder Heads	100-300 Hours 3				
Check Alternator Brushes	Yearly 3				

1 - Refer to Safe Operation Inspection section of the manual.
2 - Perform more often in extremely dusty conditions.
3 - Contact an authorized service center for service.

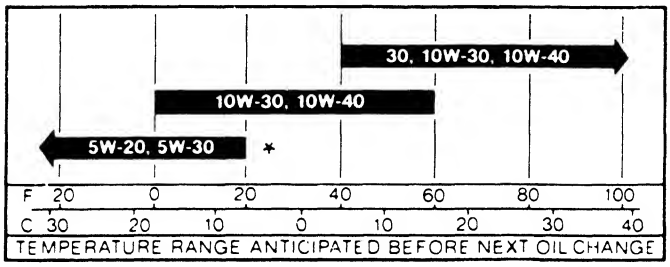
ALTERNATOR MAINTENANCE

The part of the alternator that generates electrical current normally needs little maintenance other than a yearly check of the brushes and collector rings by an authorized service center. If a major repair job on the alternator should become necessary, the electrical equipment must be checked by a competent electrician who is thoroughly familiar with the operation of electric alternators.

LUBRICATION SYSTEM

Use a high quality detergent oil classified "For Service SC, SD, SE, SF, or MS". Detergent oils keep the engine cleaner and retard the formation of gum and varnish deposits. Nothing should be added to the recommended oil. Refer to the chart below for the recommended viscosity grade.

RECOMMENDED SAE VISCOSITY GRADES



*If not available, a synthetic oil may be used having 5W-20, 5W-30 or 5W-40 viscosity.

Before adding oil, place the alternator on a level surface and clean the area around the oil plug or dipstick. Refer to the SPECIFICATIONS section for the engine oil capacity.

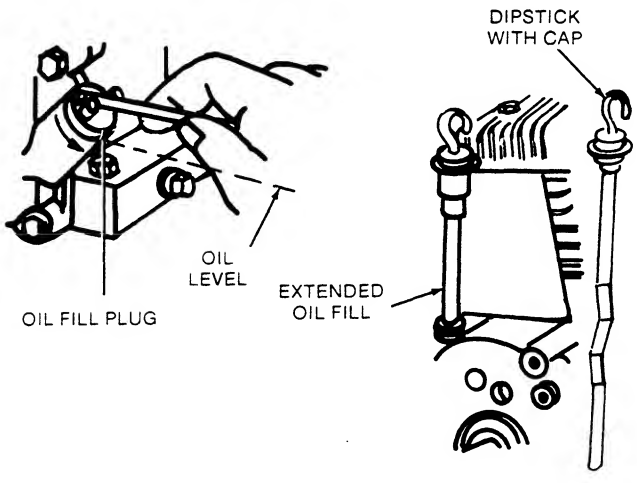


FIGURE 4. OIL FILL

Oil Fill

Sets With Oil Fill Plug: Remove oil fill plug and fill crankcase to point of overflowing. POUR SLOWLY. Replace oil fill plug (see Figure 4) when full.

Sets With Extended Oil Fill: Remove cap and dipstick. Fill to FULL mark on dipstick. POUR SLOWLY. When checking oil level, push dipstick assembly firmly but slowly until cap bottoms on tube. DO NOT OVERFILL. Dipstick assembly must be securely assembled into tube at all times when engine is operating. (see Figure 4.)

Oil Level Check

Check the oil level daily or after every 5 operating hours and add as required. Check more frequently on a new or reconditioned engine as oil consumption is higher until the piston rings seat. Use the same brand of oil as in the crankcase when adding oil between changes. BE SURE OIL LEVEL IS MAINTAINED.

WARNING ***Do NOT check oil while the alternator is operating. Hot oil could cause burns by blowing out of oil fill tube due to crankcase pressure.***

Oil Change

Change the oil after the first 5 hours of operation. Thereafter, change oil after every 25 hours of operation. Remove the oil drain plug and drain oil while the engine is warm. Replace drain plug. Remove oil fill plug or dipstick and refill with new oil of the proper grade and viscosity. Replace oil fill plug or dipstick See Figure 5.

WARNING ***Wipe up oil spills immediately to avoid an accident due to slipping.***

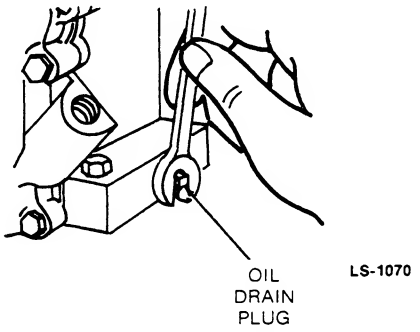


FIGURE 5. OIL DRAIN

WARNING ***Hot crankcase oil could cause burns. When draining the crankcase, take precautions such as wearing protective clothing to avoid splashing hot oil on skin or face.***

Extended Run Oil System (Optional Accessory)

The extended run oil system permits extended operation of the alternator by automatically adding oil to the crankcase when it is needed. A probe is installed in the engine crankcase which senses crankcase vacuum. When the oil level drops below a predetermined amount, the probe senses the change in vacuum and permits oil to be pumped from the reservoir tank into the crankcase. This raises the crankcase oil level to a safe operating range (1/2 to 1 pints below the full mark).

Filling The Extended Run Oil System: Fill the engine crankcase as described in the previous sections. Fill the oil reservoir tank using the same grade and weight of oil used in the crankcase. The capacity of the tank is two quarts. Refill the tank when the oil level drops below the line on the lucite oil level indicator (see Figure 6). Do NOT add oil to the reservoir before the oil level is below the indicator. Whenever the engine crankcase oil is drained during normal maintenance, the crankcase must be refilled manually.

CAUTION ***This oil system is a slow-fill device and will NOT refill an empty engine crankcase before resultant engine damage occurs.***

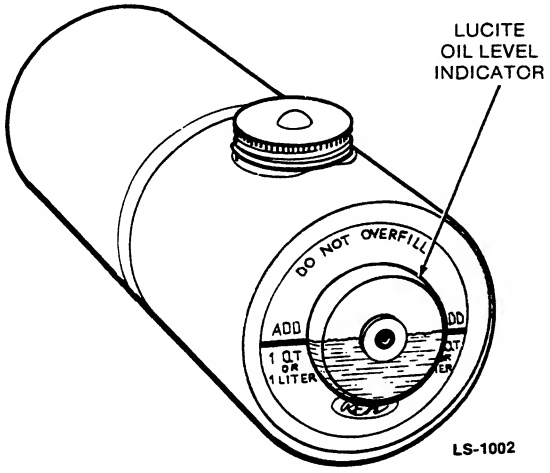


FIGURE 6. OIL RESERVOIR

FUEL SYSTEM

Fill the fuel tank with clean, fresh lead-free or regular grade gasoline. When using lead-free gasoline, the carburetor fuel mixture must not be too lean or valve life may be shortened. Do not use highly leaded premium fuels and DO NOT MIX OIL WITH THE GASOLINE.

WARNING ***Hot engine parts create a potential fire hazard if fuel is spilled while filling the fuel tank. Stop the engine and allow the set to cool before filling. Leave some space in the tank for fuel expansion.***

Remote Fuel System (Optional Accessory)

The remote fuel system has a large capacity fuel tank which permits extended operation of the alternator. Fill the tank with fuel and connect the fuel line to the tank using the quick-disconnect fittings provided. Route the fuel line away from any hot exhaust system components or moving parts. Squeeze the primer bulb to pump fuel through the fuel line and to the carburetor. The system includes a fuel valve. Refer to the fuel valve decal for valve handle positions.

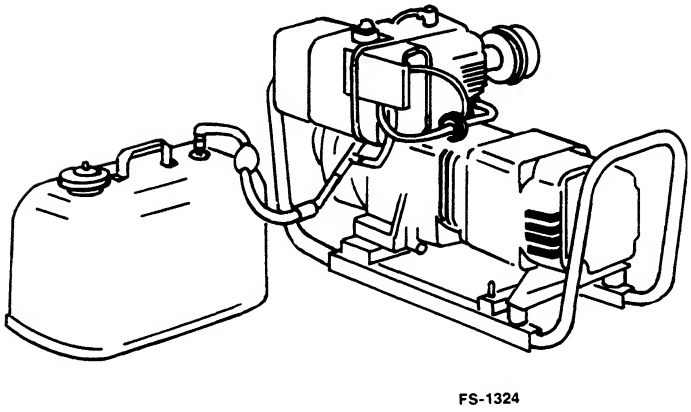


FIGURE 7. REMOTE FUEL TANK

Fuel Filter

All alternators (except the 1750 and 2250 watt models) are equipped with an inline fuel filter. Remove and replace the fuel filter after every 500 hours. When installing, make certain the inlet and outlet sides of the filter are consistent with the fuel flow. See Figure 8.

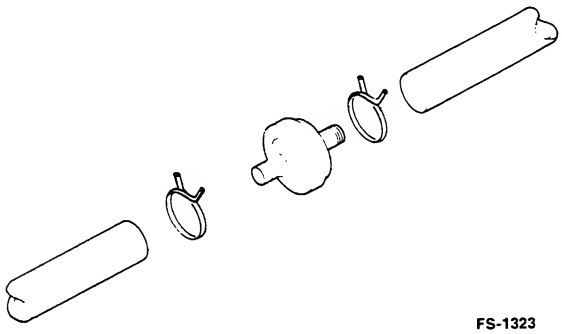


FIGURE 8. FUEL FILTER

SAFE OPERATION INSPECTION

Make a daily inspection of the alternator. Check for loose or missing parts or for damages that may have occurred during use. Inspect the following items making certain that all connections are secure and all fasteners are tight:

- Battery cable connections (electric start model)
- Fuel line and fittings
- Muffler and exhaust system
- Intake manifold cap screws
- Grounding strap
- Air cleaner wing nut
- Carburetor hold down screws
- Spark plug lead
- Inspect visually and audibly for exhaust leaks

COOLING SYSTEM

A flywheel blower fan cools the alternator by blowing air over the cylinder and cooling fins. The air path is directed by sheet metal shrouds and plates.

CAUTION ***Do not operate alternator without shrouds and plates in place or engine will overheat.***

WARNING ***Remove spark plug wire before cleaning the cooling fins to avoid accidentally starting the engine.***

Clean the rotating screen and cooling fins yearly or after 100 hours of operation, whichever comes first. Remove the sheet metal shrouds and clean the area shown in Figure 9 of any dirt or oil which may have accumulated. Clean more often if operating in extremely dusty conditions. Replace the sheet metal shroud before running the engine.

CAUTION ***Plugged or clogged cooling fins can cause overheating and engine damage.***

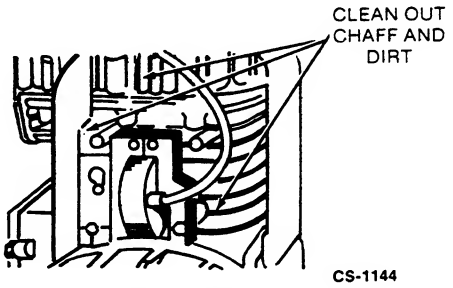


FIGURE 9. COOLING SYSTEM

SPARK PLUGS

Clean or replace the spark plug every 100 hours. A badly fouled plug will cause misfiring, poor operation, or stopping when a load is applied.

- Black deposits indicate a rich mixture.
- Wet plug indicates misfiring.
- Badly or frequently fouled plug indicates the need for a major tune-up.

Set spark plug gap at .030 in. (.76 mm) (see Figure 10) when replacing.

CAUTION ***Do not clean spark plug by sandblasting. Spark plug should be cleaned by scraping or wire brushing and washing with a commercial solvent.***

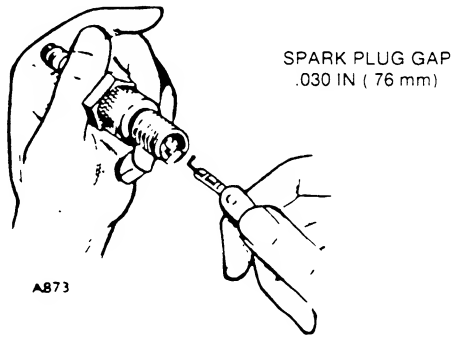


FIGURE 10. SPARK PLUG

AIR CLEANER ELEMENT

Clean and re-oil the foam element or foam pre-cleaner every 25 hours or at 3 month intervals, whichever comes first. Several different air cleaners are used with this series of alternators. Follow the maintenance procedures that correspond to your unit.

Oil Foam Air Cleaner

1. Remove wing nut and cover (See Figure 11).
2. Remove air cleaner carefully to prevent dirt from entering carburetor.
3. Take air cleaner apart and clean.
   a. WASH foam element in kerosene or liquid detergent and water to remove dirt.
   b. Wrap foam in cloth and squeeze dry.
   c. **Saturate foam with engine oil.** Squeeze to remove excess oil.
4. Reassemble parts and fasten to carburetor.

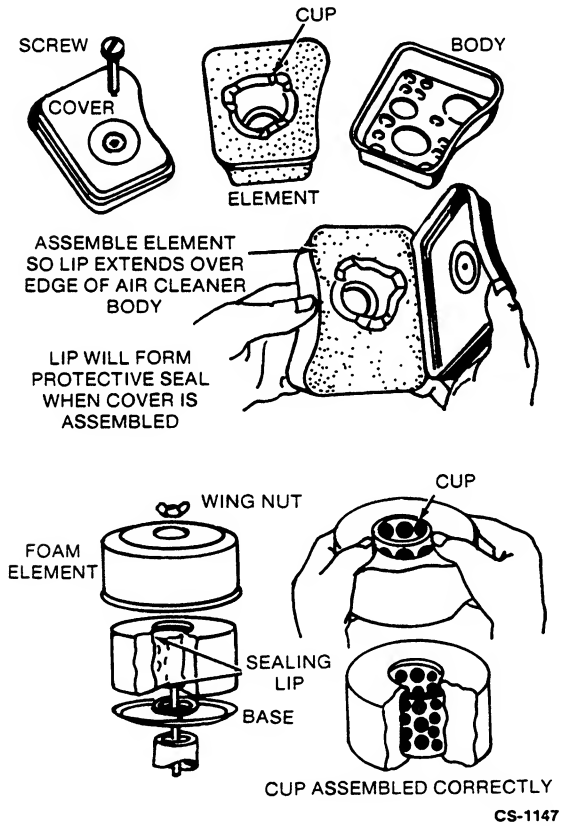


FIGURE 11. OIL FOAM AIR CLEANER

Dual Element Air Cleaner

1. Remove wing nut and cover (See Figure 12).
2. Remove foam pre-cleaner by sliding it off of the paper cartridge.
3. a. Wash foam pre-cleaner in liquid detergent and water.
   b. Wrap foam pre-cleaner in cloth and squeeze dry.
   c. **Saturate foam pre-cleaner in engine oil.** Squeeze to remove excess oil.
4. Install foam pre-cleaner over paper cartridge. Reassemble cover and screw down tight.

Yearly or every 100 hours, whichever occurs first, remove paper cartridge. Clean by tapping gently on flat surface. If very dirty, replace cartridge, or wash in a low or non-sudsing detergent and warm water solution. Rinse thoroughly with flowing water from inside out until water is clear. Cartridge must be allowed to stand and air dry thoroughly before using. Service more often if necessary.

CAUTION ***Do not use petroleum solvents such as kerosene to clean the cartridge. They will cause deterioration of the cartridge. DO NOT OIL CARTRIDGE. DO NOT USE PRESSURIZED AIR TO CLEAN OR DRY CARTRIDGE.***

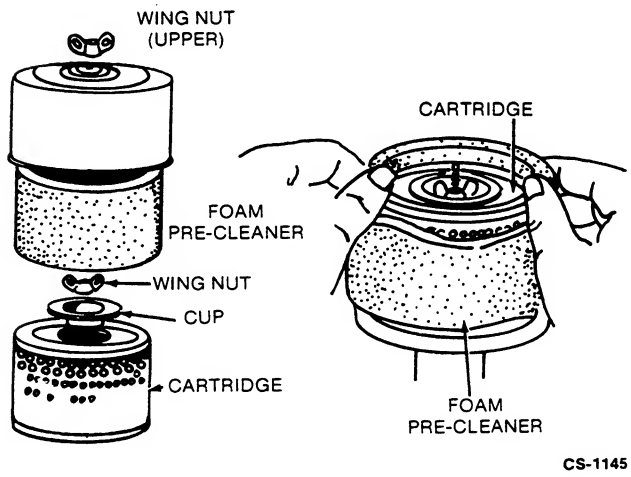


FIGURE 12. DUAL ELEMENT AIR CLEANER

EXHAUST SPARK ARRESTER

Exhaust spark arresters are standard on all alternators. Some state and federal parks require them. All spark arresters require periodic clean-out (every 50 hours) to maintain maximum efficiency and prevent clogging.

Remove the muffler deflector (if equipped) and screen assembly (see Figure 13) for cleaning and inspection. Replace the screen assembly if damaged.

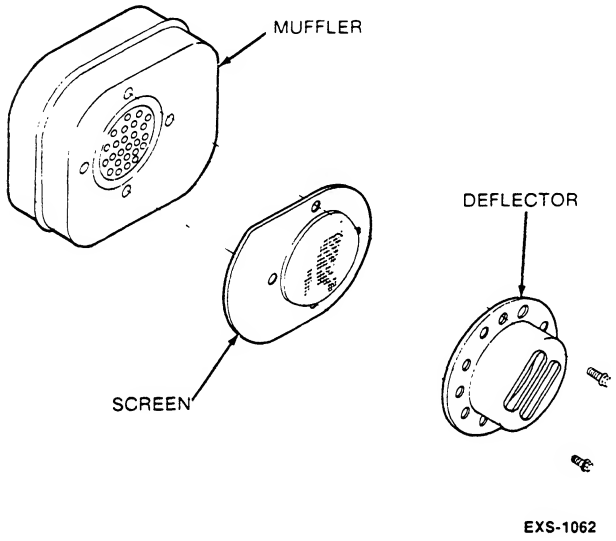


FIGURE 13. EXHAUST SPARK ARRESTER

WARNING ***Failure to replace damaged spark arrester screen could allow sparks to be emitted from muffler. This could lead to personal injury if a fire is ignited by the sparks.***

BATTERY CARE
(Electric Start Model)

To increase battery life, the operator can perform a number of routine checks and some preventive maintenance.

1. Keep the battery case clean and dry.
2. Make sure the battery cable connections are clean and tight.
3. Coat the battery terminals with a mineral grease or petroleum jelly to reduce corrosion and oxidation.
4. Identify each battery cable to be positive or negtive before making any connection. Always connect the ground (negative) cable last.
5. Maintain the electrolyte level by adding water (drinking quality or better) as needed for filling to split level marker.
6. The standard battery charger will provide a constant charge rate of 1 amp during alternator operation. If the alternator is not operated often enough to keep the battery charged, connect battery to a separate charger at least once a month to maintain a full charge.

WARNING ***Lead acid batteries emit highly explosive hydrogen gas which can be ignited by electrical arcing or a lighted cigarette. Do not smoke while charging or servicing batteries.***

Adjustments

CARBURETOR ADJUSTMENTS

The carburetor adjustment screws were set at the factory and should normally not be disturbed. Make certain the ignition is not the source of the problem before adjusting the carburetor. If the factory setting has been disturbed, it may be necessary to make an initial adjustment to allow the engine to be started. Turn the main adjustment screw IN (clockwise) until lightly seated and then back out 1-1/4 to 1-1/2 turns (see Figure 14).

WARNING ***To avoid personal injury, use extreme caution when making adjustments while the engine is running. Do not touch hot exhaust pipes or moving parts; do not wear loose clothing that may be caught in moving parts.***

Setting Main Adjustment Screw (All Models)

Start the alternator and allow it to warm up for at least 10 minutes before making any adjustments. When the procedure calls for full load, connect several appliances or use a load test panel.

CAUTION ***When determining fuel mixture settings, never force the fuel mixture adjustment needles against their seats. Forcing will damage the needles and seats and make accurate adjustment impossible.***

1. Connect a tachometer or frequency meter to the alternator and apply a full load.
2. Turn the main adjustment screw IN (clock-wise -lean) until set RPM and frequency drops.
3. Turn the main adjustment screw OUT (counter-clockwise - rich) until set RPM and frequency drops again.
4. Over a narrow range between these two settings, the alternator RPM and frequency will remain at its highest. Turn the main adjustment screw slightly OUT from the midpoint of these two settings.

Setting Idle Adjustment Screw (3000 Watt and Larger Models)

Turn the idle adjustment screw IN (clockwise-lean) until lightly seated and then back out 1-1/2 turn (see Figure 14).

CAUTION ***When determining fuel mixture settings, never force the fuel mixture adjustment needles against their seats. Forcing will damage the needles and seats and make accurate adjustment impossible.***

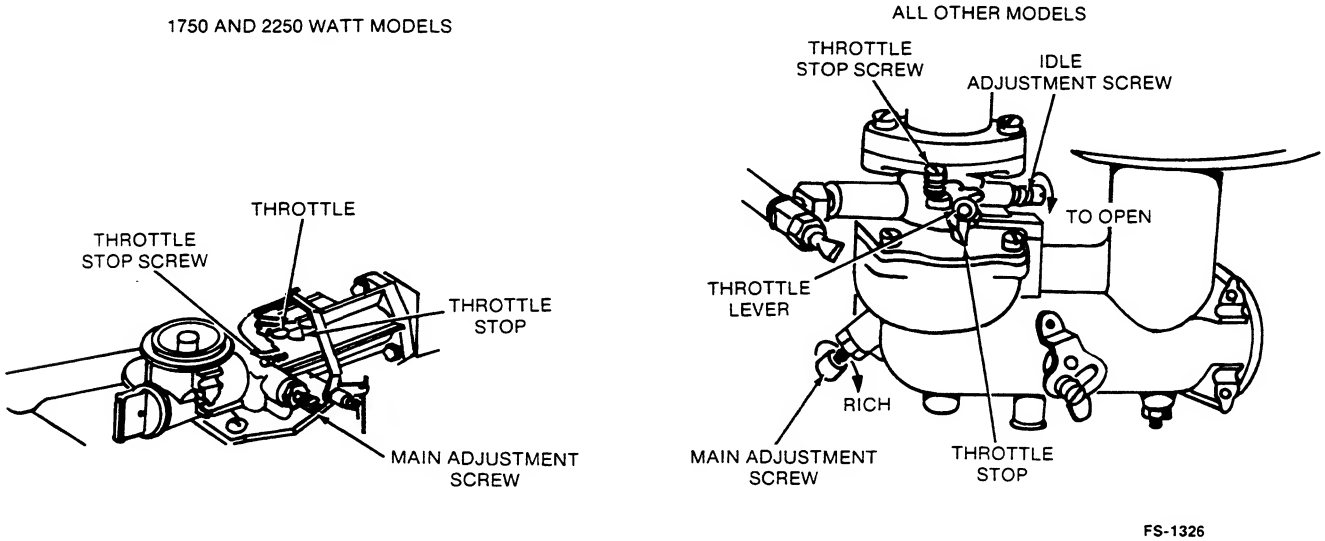


FIGURE 14. CARBURETOR ADJUSTMENTS

1. Remove all loads and connect a tachometer or frequency meter to the alternator.
2. Rotate the throttle counter-clockwise and hold against its stop.
3. Turn the idle adjustment screw IN (clockwise-lean) until set RPM or frequency drops.
4. Turn the idle adjustment screw OUT (counter-clockwise-rich) until set RPM or frequency drops again.
5. Over a narrow range between these two settings, the alternator RPM or frequency will remain at its highest. Turn the idle adjustment screw to the mid-point of these two settings.

Setting Throttle Stop Screw (All Models)

Adjust the throttle stop screw using the following procedure:

1. Remove all loads and connect a tachometer or frequency meter to the alternator.
2. Rotate the throttle counter-clockwise (see Figure 14) and hold against its stop.
3. Adjust the throttle stop screw to obtain a setting of 2298 ± 102 RPM or 38.3 ± 1.7 hertz.

To check if adjustments are correct, rotate the throttle counter-clockwise and then release. The engine should accelerate smoothly and without hesitation. Re-adjust the main adjustment screw to slightly richen the mixture if engine does not accelerate properly.

Refer to GOVERNOR ADJUSTMENTS section when all carburetor adjustments are complete. Making adjustments to the carburetor usually changes the governed speed of the engine which affects the set output voltage.

GOVERNOR ADJUSTMENTS

Before making governor adjustments, run the unit about 10 minutes under light load to reach normal operating temperature. If governor is completely out of adjustment, make a preliminary adjustment at no load to first obtain a safe voltage operating range.

Engine speed determines the output voltage and current frequency of the alternator. By increasing the engine speed, alternator voltage and frequency are increased. By decreasing the engine speed, alternator voltage and frequency are decreased. An accurate voltmeter or frequency meter (preferably both) should be connected to the alternator in order to correctly adjust the governor. A small speed drop not noticeable without instruments will result in an objectionable voltage drop.

WARNING ***To avoid personal injury, use extreme caution when making adjustments while the engine is running. Do not touch hot exhaust pipes or moving parts; do not wear loose clothing that may be caught in moving parts.***

1. Adjust the carburetor before making any adjustments to the governor (see CARBURETOR ADJUSTMENTS section).
2. Check the governor linkage and throttle shaft for binding or excessive looseness. The engine starts at wide open throttle.
3. With the warmed-up set operating at NO LOAD, adjust the tension of the governor spring (see Figure 15). Turn the speed adjusting nut to obtain a voltage of 130 volts (for 120 volt operation) or 260 volts (for 240 volt operation).

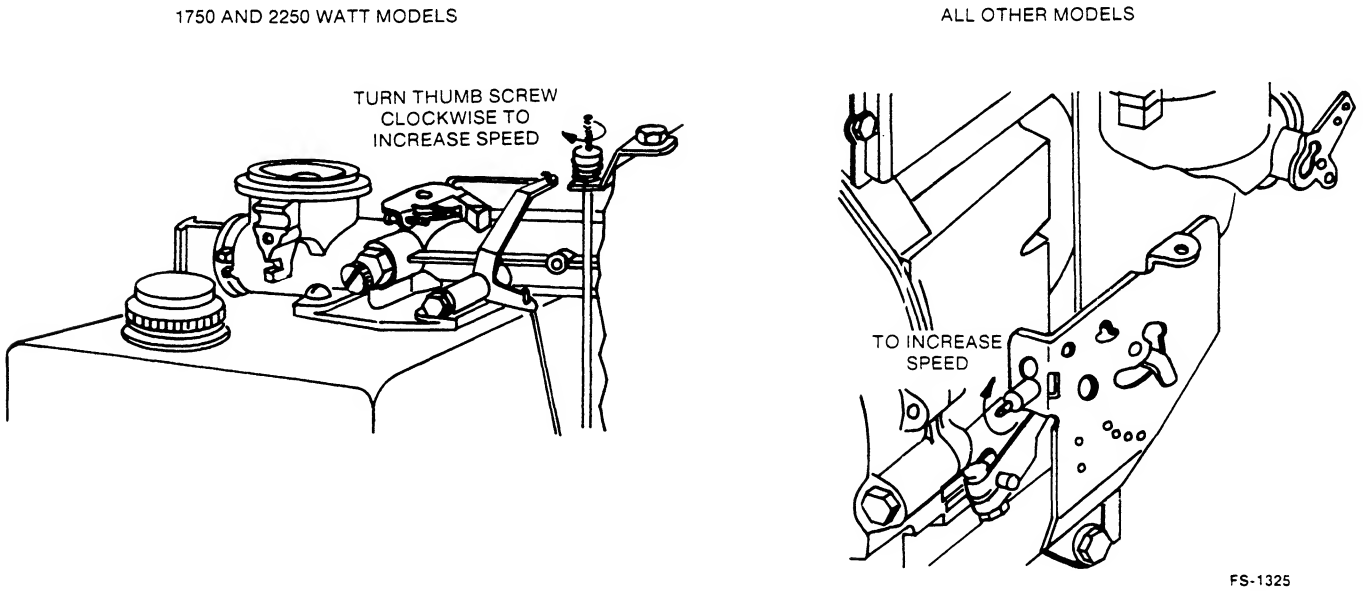


FIGURE 15. GOVERNOR ADJUSTMENTS

Optional Accessories

ACCESSORY KITS (SPEC J)		MODELS										
		Residential							Contractor			
KITS	PART NO.	1.7PE-1P/IJ	2.2PE-1P/IJ	3.0PL-1P/IJ	3.0PL-3P/IJ	3.7PP-3P/IJ	5.0PN-3E/IJ	5.0PN-3P/IJ	2.2PEI-1P/IJ	3.2PFI-3P/IJ	3.7PFI-3P/IJ	5.0PKI-3P/IJ
Battery (12V, 32 AH)	416-0617						X					
Battery Charging	305-0593			X	X	X	X***	X		X	X	X
Battery Tray	416-0784						STD					
Canvas Cover	412-0004	X	X						X			
Canvas Cover	412-0032			X	X	X	X	X		X	X	X
Dolly	410-0756						X	X				X
Extended Run *	410-0744					X	X	X		X	X	X
E-Z Tote Handle	410-0735	X	X						X			
E-Z Wheeler	410-0755	X	X	X	X	X			X	X	X	
Frame	403-1900	X	X	X	X	X	STD	STD				
Frame	403-1907									X	X	STD
Home 20A Standby	320-1072					X	X	X				
Idlematic	150-1904									X	X	X
Lifting Eye **	403-1934			X	X	X	X	X		X	X	STD
Remote Fuel *	415-0512					X	X	X		X	X	X
Twistlock (Male) (3-Wire)(120V-30A)	323-0862									X	X	X
Twistlock (Male) (4-Wire)(20A)	323-0857					X	X	X				
Twistlock (Male) (3-Wire)(240V-20A)	323-0863									X	X	X

* REMOTE FUEL KIT (415-0512) AND EXTENDED RUN KIT (410-0744) INCLUDE A FUEL TANK.

** LIFTING EYE KIT (403-1934) APPLICATION REQUIRES REMOVAL OF T-BAR HANDLE ON 3.0-3.7 KW MODELS (RESIDENTIAL AND CONTRACTOR).

***A 1 AMP BATTERY CHARGER IS STANDARD EQUIPMENT ON ELECTRIC START SETS. THE OPTIONAL 5-8 AMP CHARGER (305-0593) INSTALLS ON THE RECEPTACLE PANEL AND IS USED FOR CHARGING 12 VOLT AUTOMOTIVE TYPE BATTERIES.

Applications

These alternators have been designed to be light-weight and portable so that you can have electrical power wherever you may require it. Whether you need it for recreation, business use, home use, or emergencies, your portable alternator is ready to meet your power needs.

RECREATIONAL USES

A portable alternator can be taken to any outdoor outing where power is needed.

Power For:

Picnics
Summer cabins
Campouts
Hunting and Fishing trips
Outdoor Parties

EMERGENCY USES

Natural disasters such as floods, hurricanes, or tornadoes can interrupt utility power for days. A lengthy interruption in power can be much more than just an inconvenience.

At home, power for:	At your business, power for:	On your farm, power for:
Furnace	Lighting	Ventilation equipment
Refrigerator or Freezer	Heating	Milking machines
Stove	Office machines	Irrigation pumps
Water heater	Cooling Equipment	Lighting and heating systems
Air Conditioners	Security Systems	Electric Fencing

HOME USES

A portable alternator can also have many uses at home besides back-up for a power outage. Often, there is not a convenient power outlet for operating many outdoor appliances.

Power for:

Lawn equipment
Power tools
Air compressors
Sprayers
Hedge trimmers and weed cutters

BUSINESS USES

A mobile or portable alternator can provide power at any work site where utility power is not available.

Power for:

Construction and Repair equipment
Drills and Saws
Impact wrenches
Pumps and Compressors
Lighting towers
Welders
Battery chargers

Onan

Cummins Power Generation
1400 73rd Avenue N.E.
Minneapolis, MN 55432
1-800-888-6626
763-574-5000 International Use
Fax: 763-574-8087